Instructions for the Collection and Shipping of Human Biomonitoring Samples

SCOPE

In the event of a terrorist attack using chemical agents, blood and urine samples from victims are to be collected and shipped to the Missouri State Public Health Laboratory (MSPHL) and/or CDC. These samples are then processed as part of the Rapid Toxic Screen.

The timing of the collection of the clinical specimens is critical. Blood specimens should be collected as soon as possible, and urine samples should be collected seven to eight hours after the exposure.

The Missouri State Public Health Laboratory accepts clinical samples from a response to a chemical terrorism event. Clinical samples are defined as samples taken from human matrices—blood and urine.

The Missouri State Public Health Laboratory **does not** accept environmental samples from a response to a chemical terrorism event. Environmental samples are defined as a solid, liquid, gas chemical or object other than clinical.

All clinical samples collected from a chemical terrorism event must get prior approval from appropriate law enforcement personnel and the MSPHL before shipping to the MSPHL.

All approved clinical samples collected from a chemical terrorism event **must** be transferred to the MSPHL by appropriate law enforcement personnel.

SIGNIFICANCE OF USE

These instructions are intended to provide those submitting samples from a chemical terrorism event to the Missouri State Public Health Laboratory and/or CDC guidance for correct collection, packaging and shipping.

MATERIALS

Items listed are required supplies to collect one sample from each patient for the Rapid Toxic Screen.

Collection

1 BD Lavender top venous tubes with EDTA + 2 empty tubes/lot number*
1 BD gray top tube with NaF or green top tube + 2 empty tubes/lot number*
1 95 kPa Urine Specimen Collection cup + 2 empty cups/lot number*
1 tourniquet
1 Sterile alcohol prep pad
1 BD 21G, 1.5 inch sample needle
1 blood collection tube holder for 13mm BD tubes
1 four-slot Aqui-Pak
1 piece of absorbent paper
2 95 kPa Biohazard Specimen Shipping Bag
1 MSPHL Human Biomonitoring Sample Collection Form
1 MSPHL Chain of Custody Form
1 MSPHL Evidence Form
Gauze sponge and bandage

Evidence Tape

*MSPHL requires the shipment of the following empty collection devices that will be used for contamination testing per lot number of submitted samples. If only one sample is submitted, two empty containers from each container lot must be sent to the MSPHL. If 40 samples are submitted with the same lot number collection device, only two empty containers from each container lot must be sent to the MSPHL. Use the same packaging protocol to submit blank collection devices.

Packaging/Shipping

2 Diagnostic Specimen Boxes(23675 or23650)
2 Boxed styrofoam containers (#314 or #326)
4-8 #306 frozen freezer pillows
2 up arrow stickers
1 "Diagnostic Specimen Packed in Compliance with Packing Instruction 650" sticker
2 mailing labels and necessary postage
1 Class 9 sticker
1 Carbon Dioxide, Solid, UN1845 sticker
Dry ice

PROCEDURE

The MSPHL assumes that all samples will be collected by health care providers knowledgeable of the necessary precautions in collecting human serum samples.

1.0 Contact appropriate law enforcement official to get approval to collect sample and to transport specimens to the MSPHL.

2.0 Contact the MSPHL for approval prior to submitting sample(s) to the MSPHL in response to a chemical terrorism event.
- 2.1 During normal business hours: Emergency Response and Outreach Team at 573-526-9549.
- 2.2 After normal business hours: Missouri Department of Health and Senior Services Situation Room, 24 hours a day, 7 days a week: 800-392-0272.

3.0 A MSPHL Human Biomonitoring Chain of Custody Form along with the Human Biomonitoring Evidence Form must accompany the sample(s) from the time of sample collection to delivery at the sample(s) final destination (testing site or repository). See MSPHL Instructions for Human Biomonitoring Evidence and Chain of Custody Form, Human Biomonitoring Chain of Custody Form, and Human Biomonitoring Evidence Form located at http://www.dhss.mo.gov/Lab/chemistry.htm

4.0 Three lavender top venous tubes, one gray or green top venous tube, and a urine specimen cup must be collected from each patient when requesting MSPHL human biomonitoring analysis and the rapid toxic screen.

5.0 Blood Collection

Venous blood is to be collected using aseptic methods by trained personnel under the direction of a qualified licensed physician. If multiple patient samples are to be submitted, extreme care should be taken to maintain identification of each sample.

5.1 Acquire three BD Lavender top venous tubes with EDTA and one BD gray or green top venous tube with NaF.

5.2 Label each specimen collection device with the patients name, date of birth, collector's initials, and date/time of collection, and **label the tubes with the order they are to be drawn (ie. 1,2,3 for sequence of lavender tubes).**

5.3 Position the patient so that their arm is nearly horizontal and extended. Apply a tourniquet or blood pressure cuff. Identify and scrub venipuncture site with an alcohol wipe.

5.4 Remove the needle cap and with the needle in line with the vein, smoothly pierce the skin a few millimeters distal to the optimal vein location, enter the vein and place the needle securely in the lumen of the vein.

5.5 Fully seat the specimen tube into the tube holder and observe that the blood flow is adequate. Make minor adjustments to the needle position if flow is inadequate. Pulling the needle back slightly often initiates good flow. When the blood flow is adequate the tourniquet can be released.

5.6 **In order to prevent contamination, all of the lavender-top tubes must be filled before the gray-top tube.** As each tube fills in its previously numbered order, replace it with the next.

5.7 Mix the tubes by inverting 5-6 times.

5.8 Once all tubes are filled, place sterile gauze over the puncture site, withdraw the needle, and immediately apply firm pressure to the site and hold as necessary until a bandage can be applied.

5.9 Dispose of all collection materials, except sample tubes, into appropriate biohazard containers.

5.10 Secure the tubes with evidence tape by attaching to one side of the tube and then going over the top to be attached to the other side.

5.11 Place blood tubes into the four slots of the Aqui-Pak.

5.12 Place the Aqui-Pak containing the blood tubes into the 95 kPa Biohazard Specimen Shipping Bag and close.

5.13 Place two additional blank tubes from each type of tube collected of matching lot number with the sample tubes using the same method.

5.14 Store blood specimens at 4°C in a locked refrigerator. **Do not freeze blood specimens.** MSPHL forms should be kept with specimens at all times.

NOTE: In the event of the need to collect a pediatric sample that does not lend itself to the collection of blood, a urine sample alone is permitted to be submitted for the Rapid Toxic Screen.

6.0 Urine Collection

6.1 Collect at least 25 mls of urine in a 95kPa screw cap specimen cup.

6.2 Label each specimen collection cup with the patients name, date of birth, collector's initials, and date/time of collection.

6.3 Secure the specimen collection cup with evidence tape by wrapping the tape completely around the top and cup.

6.4 Place specimen cup **along with absorbent paper** into the 95 kPa Biohazard Specimen Shipping Bag and close.

6.5 Place two additional blank cups of matching lot numbers with the sample cups using the same method.

6.6 Immediately freeze the urine sample.

7.0 Required Forms

7.1 Complete the MSPHL Chain of Custody, Evidence, and Sample Collection Forms for each patient. Be sure to complete the forms in entirety with all requested information. See MSPHL Instructions for Human Biomonitoring Evidence and Chain of Custody Forms. Each sample set must have its own set of MSPHL Chain of Custody and Evidence form because selected samples may be forwarded to CDC or other LRN laboratories to complete analysis.

7.2 Insert required forms into pouch on the outside of the 95 kPa Biohazard Specimen Shipping Bag containing the blood samples.

8.0 Packaging (NOTE: Do not send blood and urine samples in the same box)

8.1 Place the 95 kPa Transport Bag containing the blood tubes into a 23675, 23650 or appropriate sized Diagnostic Specimen Box.

8.2 Place the Diagnostic Specimen Box containing the 95kPa Transport Bag and blood tubes with at least four #306 **frozen** freezer pillows into an appropriate sized (#326 or #314) boxed styrofoam container.

8.3 Place 95 kPa Tansport Bag containing the urine sample cup into a 23675, 23650, or appropriate sized Diagnostic Specimen Box.

8.4 Place the Diagnostic Specimen Box containing the 95 kPa Transport Bag and frozen urine sample cup with appropriate amount of dry ice into an appropriate sized (#326 or #314) boxed styrofoam container that is different than the one used for bloods.

8.5 Tape the boxed styrofoam shipping container closed and affix mailing label, return address label, a “To Be Refrigerated” sticker, a “Non-Infectious” sticker, and “up” arrows on the outside of the boxes.

8.6 Place a sticker on the address side of the outer shipping container that states “Diagnostic Specimen Packed in Compliance with IATA Packing Instructions 650.”

8.7 Place a Class 9 label and a “Carbon Dioxide, Solid, UN1845” sticker on the box containing the urine and write the amount of dry ice used on the sticker and on the Nature and Quantity of Goods sticker if using an air weigh bill. No more than 200 Kg of dry ice should be used in any one box.

Note: Multiple samples can be placed in the same diagnostic box and boxed styrofoam container as long as capacity permits.
For diagnostic specimens, the maximum quantity for a primary receptacle is 500 ml or 500 g, and each shipping container must not contain more than 4 L or 4 kg.
Please ship the urine samples frozen and separate from the blood specimens.
Please make sure that you have included two empty urine cups, 2 empty lavender top and 2 empty gray top tubes from each lot number collected. These will be used for contamination testing.

9.0 Shipping

9.1 Contact the Missouri State Public Health Laboratory for approval **prior** to shipment.

9.1.1 During normal business hours: Emergency Response and Outreach Team at 573-526-9549.

9.1.2 After normal business hours: Missouri Department of Health and Senior Services Situation Room, 24 hours a day, 7 days a week: 800-392-0272

9.2 Please ship via appropriate law enforcement personnel to:
Missouri State Public Health Laboratory
Chemistry Unit
Chemical Terrorism Response Program

307 West McCarty Street
Jefferson City, Missouri 65101

9.5 If you have any questions or problems with sample packaging or shipment, please call:
9.5.1 Mike Massman, Chemical Terrorism Laboratory Coordinator, at 573-526-9549
9.5.2 Chemistry Unit at 573-751-0633

REFERENCES

CDC Shipping instructions for samples collected from individuals potentially exposed to chemical terrorism agents, May 14, 2003.

CDC Shipping instructions for samples collected from individuals potentially exposed to chemical terrorism agents, March 2004.

California Department of Health Services Collection and Shipping of Biological Specimens Following a Chemical Incident or Terrorism Event.

IATA 2003 Dangerous Goods Regulations, 44th Addition, Packing and Shipping Instructions